

DISTRIBUTION AND HABITAT OF *CURICTA PRONOTATA* (HEMIPTERA: NEPIDAE) IN SOUTHEASTERN ARIZONA¹

Jon D. Hoekstra², Robert L. Smith³

ABSTRACT: *Curicta pronotata* is known from western Mexico and southeastern Arizona. Previous accounts of the species' Arizona distribution draw from only a few collections and localities. Distributional records clarifying the range and habitat of *C. pronotata* in Arizona are reported here.

The genus *Curicta* (Hemiptera: Nepidae) is primarily Neotropical with species entering the United States in Arizona, Texas, and Louisiana (Menke, 1979). *Curicta pronotata*'s principal range is in Mexico along the Sierra Madre Occidental; it extends from Nayarit north to eastern Sonora and western Chihuahua (Keffer 1996). *C. pronotata* has previously been reported from two different canyons in the Huachuca Mts. in southern Arizona (Dubois 1978, Keffer 1996), and Sites and Polhemus (1994) reported the species from Sabino Canyon near Tucson on the basis of an individual collected in 1937 (full record given here).

This report extends the range of the species in Arizona. *Curicta pronotata* has now been recorded from the Huachuca, Santa Catalina, and Galiuro mountain ranges in southern Arizona. Based on our own findings and habitat information from previous records, the habitat of *C. pronotata* in Arizona appears to be small shaded streams with woody debris above about 1200m.

NEW RECORDS

Hemiptera: Nepidae: *Curicta pronotata* Kuitert 1949.

Arizona: Pima County: 1 male, Santa Catalina Mts., Sabino Canyon, 29-VII-1937, E.D. Ball, UAIC; Pima County: 1 nymph, Santa Catalina Mts., Sabino Canyon, 3660' (1115 m), 32°22'00" N, 110°47'10" W, 6-VI-1997, J.D. Hoekstra, UAIC; Pima County: Santa Catalina Mts., Bear Canyon, 5530' (1685 m), 32°21'45" N, 110°42'30" W, 19-VII-1997, J.D. Hoekstra and C. Creighton, 1 male, 1 female, 12 nymphs, UAIC, 1 female, 5 nymphs, JTPC; Cochise County: 1 female, Galiuro Mts., Wildcat Canyon, 4120' (1255 m), 32°22'00" N, 110°15'30" W, 20-VIII-1996, J.D. Hoekstra and D.A. Lytle, JTPC; Cochise County, 1 male, same locality data as preceding, 21-IX-1996, J.D. Hoekstra, JTPC.

Abbreviations: JTPC = J. T. Polhemus Collection, Englewood, CO. UAIC = University of Arizona Insect Collection, Tucson, AZ.

DISCUSSION

In Sabino Canyon, a single nymph was collected from mud under a rock

¹ Received December 29, 1997. Accepted February 8, 1998.

² Center for Aquatic Ecology, Illinois Natural History Survey, 607 E. Peabody Dr., Champaign, IL 61820.

³ Department of Entomology, University of Arizona, Tucson, AZ 85721.

along the margin of a drying pool. The nymph was inactive and presumed dead until it was placed in ethanol, whereupon it revived for a short time. The nymph's behavior may have been an example of "death-feigning" (thanatosis) as reported in *Nepa* and *Ranatra*, or it may have indicated the initiation of estivation, which has been documented in *Nepa* (Sites and Polhemus 1994). This nymph is the first evidence of *C. pronotata* in Sabino Canyon since it was collected in 1937. The authors have sampled the habitat in which it was found extensively over two seasons and have found only this single nymph. We suspect that it was a "stray" which had drifted down from an upstream source population in Sabino Canyon or a tributary.

In Bear Canyon, Santa Catalina Mts., adults and especially nymphs were very abundant among woody detritus in shallow bedrock-lined pools. The stream was narrow (less than 1 m wide) and shallow (average maximum depth 30 - 40 cm). *Curicta pronotata* shared this habitat with *Abedus herberti* (Hemiptera: Belostomatidae), which was also abundant. Of the twenty *C. pronotata* collected on July 19, 3 were adults, 10 were F-1 instar nymphs, and 7 were F-2 instar nymphs. In *Curicta scorio*, the fourth and fifth stadia lasted an average of 18.56 and 18.87 days for artificially reared individuals from two populations in Texas (Keffer et al. 1994). If *C. pronotata* has a similar developmental rate, most of the individuals in the Bear Canyon population probably eclosed to the adult stage by September.

Arizona collections of *Curicta pronotata* have been very few, despite the species' fairly wide range as indicated by the records reported here. The species probably has been overlooked because of its cryptic appearance and tendency to feign death when captured (Sites and Polhemus 1994). In addition, spatial and temporal components of the species' occurrence in Arizona may have contributed to its rarity in collections.

Arizona populations of *C. pronotata* appear to be highly localized. Such local populations could be relicts of a previously continuous distribution. The Sonoran Desert region has aridified over the past 11,000 yr., with attendant restriction of previously widespread mesic biotic communities to high elevations (Hall et al., 1989). This process may have reduced the number and extent of suitable habitats for *C. pronotata*, such that it currently persists in only a few favorable habitat refuges.

Densities of *C. pronotata* probably fluctuate seasonally with changes in streamflow, as noted by Keffer (1996) for Texas populations of *Curicta scorio*. Local populations of *C. pronotata* may also be unstable from year to year in Arizona. The species is probably capable of dispersal by flight, which has been reported for *C. scorio* (Sites and Polhemus 1994). Thus the disjunct Arizona populations could be transient "sink" populations in a metapopulation with a "core" to the south in the Sierra Madre Occidental. Such a metapopulation dynamic has been reported for several southeastern Arizona butterfly species

(Bailowitz and Brock 1991).

Additional surveys and long term monitoring of the Arizona populations will be required to evaluate these alternative hypotheses about the population dynamics and biogeography of *C. pronotata* at the northern limits of its range.

ACKNOWLEDGMENTS

We thank J.T. Polhemus for making the specific determinations on individuals from the populations reported. J.D. Hoekstra also thanks the UA Department of Entomology and the ARCS (Achievement Rewards for College Scientists) Foundation for support during the time in which this research was conducted.

LITERATURE CITED

- Bailowitz, R.A. and J.P. Brock.** 1991. Butterflies of Southeastern Arizona. Sonoran Arthropod Studies, Inc., Tucson, Arizona.
- DuBois, Mark B.** 1978. A recent record of *Curicta pronotata* Kuitert (Hemiptera:Nepidae) from its type locality. Entomol. News 89: 207.
- Hall, W.E., C.A. Olson, and T.R. VanDevender.** 1989. Late Quaternary and Modern Arthropods from the Ajo Mountains of southwestern Arizona. Pan-Pacific Ent. 65: 322-347.
- Keffer, S.L.** 1996. Systematics of the New World waterscorpion genus *Curicta* Stål (Heteroptera: Nepidae). J. New York Entomol. Soc. 104(3-4): 117-215.
- Keffer, S.L.** 1991. Taxonomic revision of the neotropical genus *Curicta* Stål (Insecta: Heteroptera: Nepidae). Ph.D. dissertation, S. I. U., Carbondale.
- Keffer, S.L., S.J. Taylor and J.E. McPherson.** 1994. Laboratory rearing and descriptions of immature stages of *Curicta scorio* (Heteroptera: Nepidae). Ann. Entomol. Soc. Am. 87(1): 17-26.
- Kuitert, Louis C.** 1949. Some new species of Nepidae (Hemiptera). J. Kansas Entomol. Soc. 22: 60 - 68.
- Menke, A.S.** 1979. Family Nepidae. Pp. 70-75 in A.S. Menke [ed.], The semiaquatic and aquatic Hemiptera of California (Heteroptera: Hemiptera). Bull. Calif. Ins. Surv. 21: 1-166.
- Polhemus, J.T.** 1976. Notes on the North American Nepidae. Pan-Pacific Ent. 52: 204-208.
- Sites, R.W. and J.T. Polhemus.** 1994. Nepidae (Hemiptera) of the United States and Canada. Ann. Entomol. Soc. Am. 87(1): 27-42.